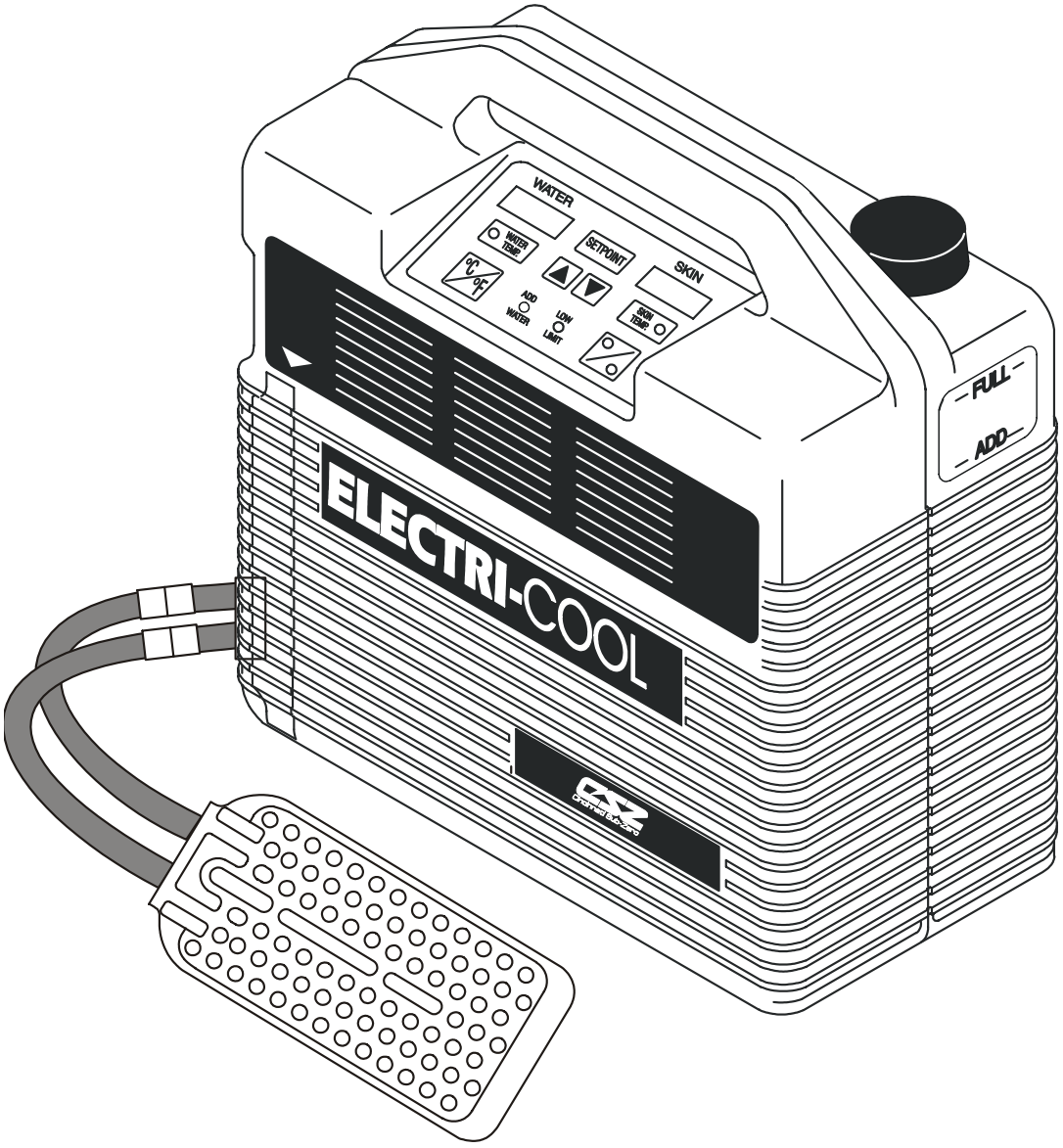
ELECTRI-COOL®

Localized Cold Therapy Unit

Product Manual



Model 757

Cincinnati Sub-Zero

LIMITED ONE YEAR WARRANTY

SCOPE OF WARRANTY
Cincinnati Sub-Zero Products, Inc. warrants the *Electri-Cool*® Localized Cold Therapy Unit for one year from date of purchase. During the warranty period Cincinnati Sub-Zero will repair or replace, at its option, any Product which is defective in materials or workmanship or which fails to meet the published product specification for that model. This Limited Warranty is made only to the original purchaser of the Product and is non-transferable. The remedies described in this Limited Warranty are the exclusive remedies for breach of warranty. **THIS WARRANTY SHALL NOT APPLY TO ANY PRODUCT WHICH HAS BEEN ALTERED OR MODIFIED IN ANY WAY OR WHICH HAS BEEN SUBJECTED TO MISUSE OR ABUSE.**

DISCLAIMER OF IMPLIED WARRANTIES
The foregoing Express Limited Warranty is given in lieu of any and all other express or implied warranties.
CINCINNATI SUB-ZERO MAKES NO OTHER WARRANTIES INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

LIMITATION OF REMEDIES
In no case shall Cincinnati Sub-Zero Products, Inc. be liable for any special, incidental or consequential damages whether based on breach of warranty or other legal theory. Some states do not allow limitations on warranties or on remedies for breach in certain transactions. In such states, the limits in this paragraph and the preceding paragraph do not apply.

WARRANTY CLAIMS
In the event of a warranty claim within the warranty period please take the following steps:

1. Notify the Cincinnati Sub-Zero Products, Inc. Customer Service Department at Toll Free: 1-800-989-7373 or contact your local Cincinnati Sub-Zero representative. Please provide details about the nature of the problem and include the product serial number. Upon receipt of this information, Cincinnati Sub-Zero will provide you with a date for service or a return shipping authorization.

2. Upon receipt of the shipping authorization, forward the equipment, freight prepaid, to the location
   specified in the shipping authorization.

Your compliance with these steps will help assure that you receive prompt warranty service for your Product.

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1. Introduction

1.1 Purpose

The purpose of this manual is to provide operation, maintenance, repair, and service instructions for the *Electri-Cool* Localized Cold Therapy Unit.

1.2 Indications—Localized Cold Therapy Equipment

Cold therapy has been found to be clinically effective in accelerating the healing of damaged tissue, and in retarding metabolism within the tissue cells.

Localized cold therapy is used in the operating room, recovery room, intensive care unit, physical therapy, and in individual patient rooms. It is used effectively to treat surgical incisions, as well as wounds and inflammation caused by traumatic injury. It is prescribed with many types of surgery, for example:

- Orthopaedic (Arthroscopy, Anterior Cruciate Ligament Repair, Arthroplasty for Hip, Knee, and other Total Joint Replacement)
- Neurologic/Orthopaedic (Laminectomy)
- Abdominal (Hernia, Cholecystectomy)
- Oral/Maxillofacial/Plastic (Dental Extractions, Rhinoplasty, Augmentations, Face Lifts)
- Urological (Vasectomy, Prostatectomy, Urological Implants)
- Obstetrical/Gynecological ("C" Section, Episiotomy, Hysterectomy)

In most cases, cold therapy is applied immediately following the surgical procedure directly to the wound site. This acts to reduce swelling and pain, while also reducing or eliminating the need for pain-killing medications. For the specialty of hand surgery, cold therapy is also applied to the upper extremity before and during the procedure in conjunction with a tourniquet.

Other conditions indicating the application of cold therapy are:

- Acute injuries
- Alopecia
- Arthritis
- Bruises/contusions
- Cellulitis
- Chronic pain
- Low back pain
- Muscle spasms
- Sprains
- Strains

1.3 Contraindications

Observe patient's skin condition frequently due to individual differences in sensitivity and susceptibility to injury from cold or heat and/or externally applied chemicals or pressure. Patients at greatest risk are those unconscious, on prolonged therapy, diabetics, children, and persons incapacitated or with insensitive skin or compromised circulation.

2. Description

2.1 Description

The *Electri-Cool* Unit consists of a plastic reservoir for holding distilled water; a float switch to sense water level; a pump for circulating water through an external pad; a thermoelectric assembly to cool the water; a microprocessor-based electronic control to regulate water temperature and a fan to transfer absorbed heat to the ambient air.

A phone jack labeled "SKIN PROBE" allows connection of a 400 Series patient temperature probe for monitoring and/or controlling patient skin temperature. The control panel offers two modes of operation: "WATER TEMP" or "SKIN TEMP".

- In the "WATER TEMP" mode, the operator selects the desired ***water*** temperature setpoint and the unit maintains the ***water*** at this temperature.
- In the "SKIN TEMP" mode, the operator selects the desired ***skin*** temperature, as measured by the remote probe, and the unit automatically lowers the water temperature to maintain the ***skin*** temperature at the setpoint.
- In the "WATER TEMP" mode the setpoint range is 40° to 68°F (4° to 20°C) and in the "SKIN TEMP" mode the setpoint range is 50° to 86°F (10° to 30°C).

Audible and visible alarms indicate "ADD WATER" and "LOW LIMIT". Digital displays indicate actual water temperature and skin temperature (when a probe is connected) in degrees Fahrenheit or Celsius.

2.2 Accessories

The essential accessories for the *Electri-Cool* Unit are the *Temp-Pad*® or Maxi-Therm® Lite Thermal Pads , *Temp-Hose*® Connection Hose, *Steri-Probe*® skin probe and reusable cable.

The Thermal Pads consist of two layers of plastic sealed together to provide multiple passageways for water flow in a random-flow pattern designed to prevent occlusion.

Temp-Pad® Localized Cold Therapy Pads

Urethane with Foam Backing	**Sterile w/o Straps**	**Sterile w/Straps**
3" x 18" (7.6cm x 45.7cm)	318-US	
5" x 10" (1 2.7cm x 25.4cm)	510-US	510-USS
7" x 16" (1 7.8cm x 40.6cm)	716-US	
8" x 14" (20.3cm x 35.6cm)	814-US	814-USS

11" x 12" (27.9cm x 30.5cm)	1112-US	1112-USS
12" x 15" (30.5cm x 38.1 cm)	1215-US	

Maxi-Therm® Lite Localized Temperature Therapy Pads
EVA with Non-Woven Backing, Not Sterile

25" x 4" (63.5cm x 10.2cm)	870
22" x 16" (55.9cm x 40.6cm)	871
25" x 19" (63.5cm x 48.3cm)	872
18" x 12.5" (45.7cm x 31.8cm)	873

COOLTEMP® Localized Cold Therapy Pads
Urethane with Foam Backing, Sterile

3" x 20" (7.6cm x 50.8cm)	CT-60
5" x 10" (12.7cm x 25.4cm)	CT-50
5" x 10" (1 2.7cm x 25.4cm)	CT-50SS (self-sealing couplings)
11" x 10" (27.9cm x 25.4cm)	CT-99
12" x 18" (30.5cm x 45.7cm)	CT-216

ImmobilICE® Supports consist of a Temp-Pad® P ad contained within a polypropylene felt body, brushed nylon outer laminate and Tietex 100% polyester with hook and loop closures.

ImmobilICE Supports, Sterile

Universal Back Support	814-IMB
Universal Hip Support	814-IMH

Temp-Pad Wraps

Shoulder Wrap - small/medium	707-WSS
Shoulder Wrap - large/x-large	707-WSL
Knee Wrap	707-WKN

Temperature Probes

Reusable Cable	4900B
Steri-Probe®, Sterile disposable Skin Probe	499B

The pads are connected to the unit via a hose with self-sealing “quick-connect” couplings containing automatic shut-off valves at each end.

Temp-Hose

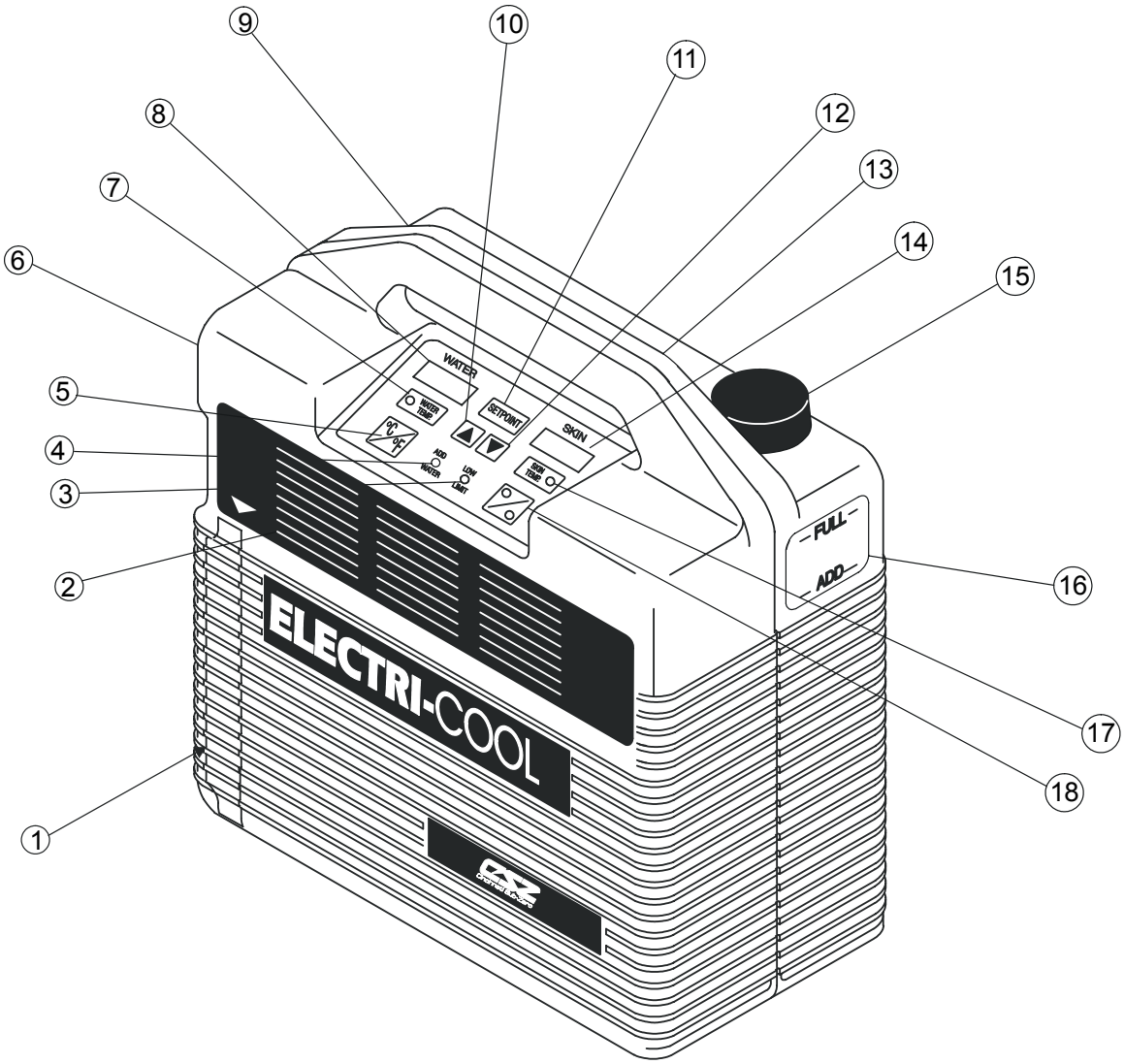
Insulated Connecting Hose, 6' (1.83m)	757-HIN
Insulated Dual Pad Connecting Hose, 8' (2.44m)	757-H8D

Other Accessories

Bed Bracket	757-BBK
Disposable Filter	757-FIL
Mobile Stand (Requires 757-BBK)	757-MST

2.3 Incoming Inspection

Shipping cartons should be inspected upon receipt. If goods are damaged from shipping, make a claim immediately to the carrier.



3. Operation

CAUTION: Federal (USA) Law restricts this device to sale by or on the order of a physician.

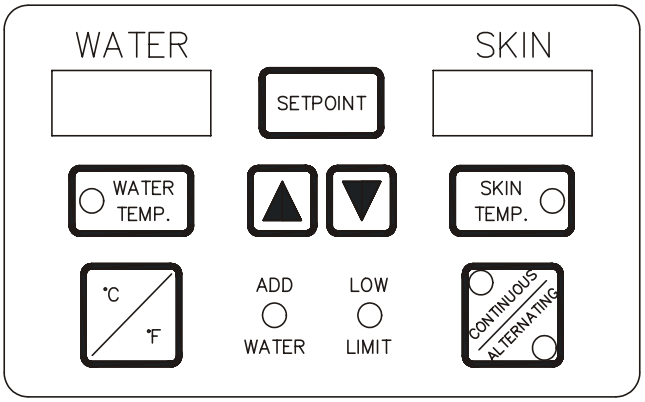
3.1 Theory of Operation

The *Electri-Cool* Unit provides a flow of temperature-controlled water to an external pad. The unit, therefore, provides a means of cooling a localized area of the body.

Two modes of operation are available to the operator: "WATER TEMP" and "SKIN TEMP". (See Fig. 3.1, *Electri-Cool* Control Panel.)

- In the "WATER TEMP" mode, the operator selects the desired ***water*** temperature and sets the "SETPOINT" accordingly. The *Electri-Cool* System then provides ***water*** at the "SETPOINT" temperature. To cause a change in pad temperature, the operator must change the water temperature setpoint.
- In the "SKIN TEMP" mode the operator selects the desired ***skin*** temperature and sets the "SETPOINT" accordingly. The unit then automatically provides water at a temperature necessary to maintain the desired ***skin*** temperature.

Fig. 3.1 - Control Panel



Note: *The "SKIN TEMP" mode requires the connection of a remote patient temperature probe to sense skin temperature. If the probe becomes disconnected, opened or shorted, an error code ("EEP") will show in the "SKIN TEMP" display and an audible alarm will sound.*

Protection against overcooling is provided by a programmed low limit which activates at 36°-38°F (2°- 3°C) and automatically disconnects power to the thermoelectric unit and pump motor. In addition, if the water in the reservoir reaches

a low level, an alarm alerts the operator and power is removed from the pump and thermoelectric unit. All alarms are indicated by visual and/or audible signals.

3.2 Safety Precautions

The *Electri-Cool* Localized Cold Therapy Unit has been designed to provide maximum thermal transfer efficiency at optimum safety. Safety features include:

- Microprocessor control to ensure accuracy of temperature settings at all times by eliminating the need for

  calibration.
- Digital display of actual water temperature, setpoint temperature, and skin temperature (when a probe is attached).
- Audible and visual alarms to indicate activation of programmed low limit at 36°-38°F (2°- 3°C) (power to the cooling unit and pump motor automatically disconnected)
- Audible and visual alarms to indicate disconnected, open or shorted temperature probe.
- Audible and visual alarms to indicate a low water level in the reservoir (power to thermoelectric unit and pump motor automatically disconnected).

CAUTION: Read the "Operation" portion of this manual before using product. Water or skin temperature must be set as prescribed by physician. Observe patient's skin condition frequently due to individual differences in sensitivity and susceptibility to injury from cold and/or externally applied chemicals or pressure. Patients at greatest risk are those unconscious, on prolonged therapy, diabetics, children, and persons incapacitated or with insensitive skin areas or compromised circulation.

DANGER: Risk of explosion if used in the presence of flammable anesthetics.

CAUTION: Electric shock hazard. Do not remove cover. Service to be performed by qualified service personnel only.

3.3 Filling Instructions

Remove reservoir cap and fill reservoir to full mark with distilled water only. Replace cap.

3.4 Pad Connecting Instructions

Attach pad connecting hose to unit by inserting male couplings on 6 foot (1.83 meter) connecting hose into female couplings on unit. Be sure couplings are locked together tightly. (An audible "click" can be heard when couplings lock together.)

Select a CSZ Thermal Pad and insert the male couplings from the pad into the female couplings on the hose. Again, make sure couplings are locked together tightly. The hose and pad must be free of kinks that might restrict flow. Place or wrap pad onto the area of the patient to be treated.

3.5 Remote Probe Connection

Place a skin temperature probe onto the patient as instructed by the attending physician. Connect the probe to the reusable cable and then insert the plug end of the cable into the jack on the side of the unit marked "Skin Probe".

Note: *Use only 400 series patient temperature probes.*

3.6 Power Connection

3.6.1 Plug the power cord into a receptacle providing the appropriate voltage for your unit. The *Electri-Cool* System is now ready to begin operation.

CAUTION: Minimum clearance of 2 inches (5 cm) air space must be maintained on left and right sides of unit where cooling slots are located. Restriction of air flow will reduce cooling performance and cause unit to overheat.

3.7 Start-Up

Turning the power switch to the "On" position causes the following:

- Power switch illuminates and fan energizes.
- All visual indicators flash four times.
- The audible alarm sounds.
- The setpoint and mode of operation to which the unit was last set flashes four times.

The purpose of this "test" sequence is to allow the operator to check for proper operation of all indicators. The operator should make sure that all indicators are operating each time the unit is turned on. If an indicator does not illuminate, remove unit from service and repair.

3.8 Mode of Operation

Select the mode of operation desired by pressing the "WATER TEMP" or "SKIN TEMP" switch on the control panel. The unit will always begin operation in the mode to which it was last set, even if it has been unplugged. An amber indicator will illuminate adjacent to the pressed switch indicating the mode of operation chosen. If the "SKIN TEMP" mode is selected without a probe connected, the "SKIN TEMP" readout will display an error code, indicating "EEP", and the audible alarm will sound.

3.9 Setpoint

Once the mode of operation has been selected, the setpoint may be raised or lowered. To change the setpoint, press the "SETPOINT" switch (the display will flash) and simultaneously press either the increment (up arrow) or decrement (down arrow) switch. The "arrow" switches can only be activated while pressing the "SETPOINT" switch. The "SETPOINT" temperature of the mode selected will display in the respective window of that mode. Each time the unit is turned on, the setpoint will be the temperature at which it was last set. Therefore, power interruptions will not affect setpoint. The setpoint range is 40° to 68°F (4° to 20°C) in the "WATER TEMP" mode, and 50° to 86°F (10° to 30°C) in the "SKIN TEMP" mode.

3.10 Continuous/Alternating Mode

The “CONTINUOUS/ALTERNATING" Mode allows for selection of either continuous delivery of cold therapy or alternating cold therapy, i.e., the unit cycles cooling on for 30 minutes and cooling off for 15 minutes.

3.11 Add Water

The “ADD WATER” indicator illuminates and the audible alarm sounds when the water falls to a low level. Power to the cooling unit and pump is automatically disconnected.

3.12 Cleaning

The *Electri-Cool* Localized Cold Therapy Unit case is constructed of plastic. Wipe outer surface with a cloth soaked in a solution of water and mild detergent. Rinse cloth of excess solution before applying to unit.

3.13 Storage

The *Electri-Cool* Unit may be stored full of water for short-term storage of one week or less. If long-term storage is contemplated, it is best to drain the unit.

3.14 Draining

Drain the *Electri-Cool* Unit by removing the fill cap and inverting the unit over a sink.

4. Specifications

ELECTRI-COOL UNIT

Physical

Size	12.25in.W x 13.25in. H x 6.375in. D (31.1 cm W x 33.7 cm H x 16.2 cm D)
Weight (Dry)	26 lbs. (11.79 Kg)
Hose	6 ft. (1.8 m), Insulated
Couplings	Quick-Connect
Case Material	Off-White Plastic

Control System

Type	Microprocessor-based, Digital
Display Resolution	±1°
Self-Calibrating	60 Second Intervals
TEMP. Displays	7 Segment, 3 Digits
Display Range (Water)	32° to 122°F (0° to 50°C)
Display Range (Patient)	32° to 122°F (0° to 50°C)

Cooling System

Setpoint Range (Water)	40° to 68°F (4° to 20°C)
Setpoint Range (Patient)	50° to 86°F (10° to 30°C)
Cooling Unit	Solid State, Thermoelectric Modules

Circulating System

Reservoir Capacity	23 oz. (680 ml)
Reservoir Fluid	Distilled Water
Fill Cap	Vented
Flow Rate	10-13 gph (37.8-49.2 lph)
Maximum Pressure	2.5 PSI (175.76 g/cm^2)

Safety System

Low Limit Alarm	36°-38°F (2°-3°C)
Add Water Alarm	Removes power from pump and cooling unit
Warning Lights	ADD WATER and LOW LIMIT
Audible Alarms	ADD WATER and LOW LIMIT; Selection of SKIN TEMP mode without a probe connected; Malfunction of the water temperature sensor.

Specifications subject to change without notice

Electrical System

110-120V Unit

Voltage	110-120V, 60 Hz
Current	5 AMP (at 115V, 60 Hz)
Circuit Breaker	7 AMP
Power Cord	3 Conductor, 16 AWG, 12ft. (3.66 m) long with Hospital Grade Plug
Leakage Current	Under 300 Microamperes

220-240V Unit

Voltage	220-240V, 50Hz
Current	3.0 AMP
Fuse	3.15 AMP
Leakage Current	Under 500 Microamperes

100V Unit

Voltage	100 V, 50/60 Hz
Current	4.5 AMP
Circuit Breaker	7 AMP
Power Cord	3 Conductor, 16 AWG, 12ft. (3.66 m) long with Hospital Grade Plug
Leakage Current	Under 300 Microamperes

Steri-Probe® Sensor	***499B***
Type	Thermistor, 400 Series, Skin Sensor, Sterile Disposable
Accuracy	±.2°C at 37°C
Temp-Probe Cable	12ft. (3.66 m)

Bed Bracket	***757-BBK***
Bed Bracket	Steel, Powder Coated with vinyl coated hangers
Dimensions	12in. W x 11.5in. H x 8.5in. D (30.5 cm W x 29.2 cm H x 21.6 cm D)

Temp-Stand®	***757-MST***
Material	Steel, Powder-Coated
Casters (5)	4in. diameter (10.2 cm)
Dimensions	41.5in. High (105.4 cm) 22in. Diameter Base (55.9 cm) 9.5in. (24.1 cm) Deep Basket

for pads, hose, and probes: cord wrap on back.

5. General Maintenance and Checkout Procedures

5.1 General

This section provides recommended preventive maintenance and checkout procedures for the *Electri-Cool* Localized Cold Therapy Unit.

Maintenance and checkout procedures must be performed by qualified personnel, such as a biomedical electronics technician or a clinical engineer familiar with good practice for medical devices.

CAUTION: Repairs of CSZ equipment by unqualified persons may void the warranty.

5.2 Preventive Maintenance

A complete check of all *Electri-Cool* parameters should be made on a regularly scheduled basis. Frequency of checkout should follow your hospital's guidelines for this type of equipment. CSZ suggests preventive maintenance at least every three months.

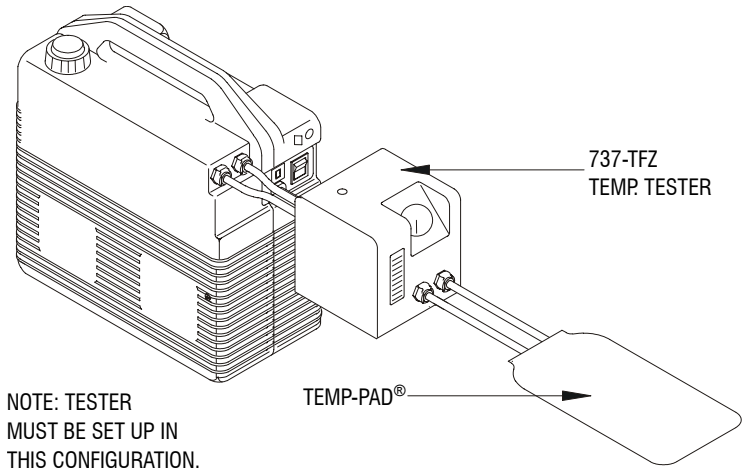
5.3 Checkout Procedures

It is suggested you perform the following procedures in their order of listing and document the results on a Preventative Maintenance Inspection Record.

1. **Exterior Physical Inspection.** Look for cracked, bent, missing, or otherwise damaged parts. Carefully inspect the power cord for cuts or exposed wire. Check the plug for missing or bent pins.

   Connect the pump to the temperature/flow tester, Cat. No. 737-TFZ and a thermal pad, as shown in Fig. 5.1. Fill the unit with distilled water and plug into a grounded outlet providing the correct voltage and frequency. Turn unit on.

Fig. 5.1 - Temperature/Flow Tester



2. **Flow Test.** Maximum flow rate is obtained with the pad lying flat on a smooth surface. If no flow rate is observed, check for reversed connections to pump, kinked pad or hose, or couplings not properly seated and locked together. Check flow rate. If less than 34 lph, check pump and/or pad for restrictions. See Trouble Shooting Guide, Section 6.
3. **Temperature Test.** Take readings from the dial thermometer or add water to the thermometer well and insert a glass or digital thermometer probe with appropriate range such as 25° to 125°F or 0° to 50°C. Note temperature every 30 seconds for five minutes, (ten readings). Record the average of these readings. Temperatures should average $\pm$1°F ($\pm$1°C) of reading on digital readout. If out of calibration, refer to paragraph 5.4.
4. **Add Water Switch Test.** Drain the reservoir to below the "Add" mark. The audible alarm should sound, the "ADD WATER" indicator on the front panel should illuminate, and the pump should de-energize.

Note: *To perform the next three tests, remove the filter drawer to allow access to the fan frame.*

5. **Dielectric Withstand Test.** Plug the *Electri-Cool* Cold Therapy Unit into your Dielectric tester and turn the unit on. Attach the ground clamp to the fan frame. The 100V and 115V units must withstand 1000V for one minute.
6. **Ground Continuity Test.** Using an ohmmeter, measure the resistance between the fan frame and the ground pin of the power plug. This value should not exceed 0.1 ohm.
7. **Leakage Current Test.** Connect ground lead clamp of leakage tester to the fan frame. Plug unit into tester. Test unit in all combinations of power switch off and on; cooling off and on; normal and reverse polarity; and normal and open ground. Record highest reading. If more than 300 microamperes (Refer to Trouble Shooting Guide, Section 7. Disconnect current leakage tester set-up.
8. **Low Limit Alarm Test.** Add cold (below 36°F [2°C]) water to the reservoir while the unit is running and observe the "WATER TEMP" readout. At 36°-38°F (2°-3°C) the "Low Limit" indicator should illuminate and the audible alarm should sound.

   Note: *It may be necessary to release some water from the pad or hose to allow the reservoir water to enter the circulatory path.*

5.4 Calibration

The *Electri-Cool* Localized Cold Therapy Unit contains a microprocessor-based temperature controller. It does not require calibration and cannot be calibrated by service personnel. The control self-calibrates every 60 seconds, effectively zeroing out component value drifts due to aging. The unit does not compensate for calibration variables in the temperature sensor. If the temperature readout is out of specification, factory repair or replacement may be necessary.

6. Component Removal and Replacement

6.1 General

This section provides instructions for the disassembly and removal of the major components contained within the *Electri-Cool* Localized Cold Therapy Unit. Performing steps in reverse order for reassembly also means substituting in the directions "reconnect" for "disconnect", "replace" for "remove", etc. Refer to Figs. 8.1-8.9 for component identification. *Note: Make sure unit is unplugged and all necessary tools are available before attempting any of the following procedures.*

CAUTION: Working with electronic boards, plugs and cables requires delicate handling. Proper Electro Static Discharge (ESD) handling procedures should be followed during replacement of any electronic board.

6.2 Front to Rear Enclosure

1. Remove drawer [1].
2. Remove four white headed screws [13] from the front enclosure. Do not remove the white headed screws [13] from the rear enclosure.
3. Remove six recessed screws [14] from the rear enclosure.
4. Separate the two halves enough to allow access to the wiring connecting the two halves.
5. Disconnect the cable from the vertical power supply board [30]; disconnect the cable from the CPU board [38].

To reassemble the two halves, perform steps 1-5 in reverse order.

6.3 Vertical Power Supply Board

1. Separate the front and rear enclosure halves. See Front to Rear Enclosure, 6.2.
2. Disconnect the fan and power wire connections from the vertical power supply board [30].
3. Remove the 6-32 nut(s) securing the ground wires to the vertical power supply board.
4. Remove the seven screws [32] securing the board and lift out.

To reinstall the vertical power supply board, perform steps 1-4 in reverse order.

6.4 CPU Board

1. Separate the front and rear enclosure halves. See Front to Rear Enclosure, 6.2.
2. Disconnect the ground wire [40] from the CPU board [38].
3. Remove the four nuts [44] and three lockwashers [43] securing the CPU board to the front enclosure. Note the orientation of item [39] for reassembly.
4. Carefully disconnect the front panel [36] connector from the CPU board.
5. Disconnect the remaining cables from the CPU board.
6. Carefully remove the CPU board from the front enclosure.

To reinstall the CPU board, perform steps 1-6 in reverse order.

6.5 Fan

1. Separate the front and rear enclosure halves. See Front to Rear Enclosure, 6.2.
2. Remove the 6-32 nut securing the ground wires to the vertical power supply board [30] and remove the fan ground wire.
3. Disconnect the fan wiring connector from the vertical power supply board [30].
4. Remove the two screws [33] securing the fan [29] to the front enclosure.
5. Remove the fan.

To reinstall the fan, perform steps 1-5 in reverse order.

6.6 Control Panel

1. Separate the front and rear enclosure halves. See Front to Rear Enclosure, 6.2.
2. Remove the CPU board. See CPU board, 6.5.
3. Remove the standoff [42] securing the control panel ground tail.
4. Insert a knife blade under an edge of the control panel [36] and lift until the panel can be grasped with fingers. Continue to separate the panel from the enclosure.

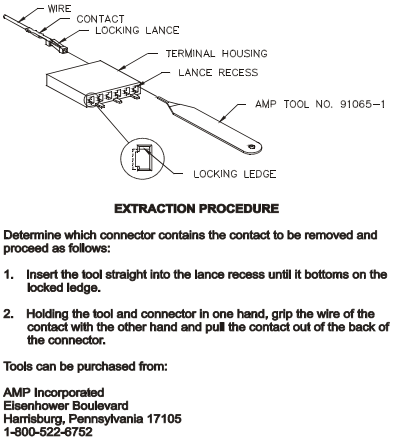

WIRE
CONTACT
LOCKING LANCE
TERMINAL HOUSING
LANCE RECESS
AMP TOOL NO. 91065-1
LOCKING LEDGE
EXTRACTION PROCEDURE
Determine which connector contains the contact to be removed and proceed as follows:
1. Insert the tool straight into the lance recess until it bottoms on the locked ledge.
2. Holding the tool and connector in one hand, grip the wire of the contact with the other hand and pull the contact out of the back of the connector.
Tools can be purchased from:
AMP Incorporated
Eisenhower Boulevard
Harrisburg, Pennsylvania 17105
1-800-522-6752

Fig. 6.1 - Extraction Procedure

To replace the control panel, remove the backing from a new panel and carefully install on front enclosure. Perform steps 1-3 in reverse order.

6.7 Pump Removal

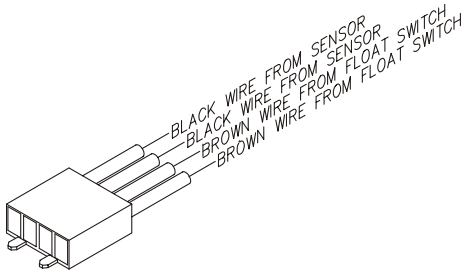
1. Separate the front and rear enclosures. See front and rear enclosure, section 6.2.
2. Remove the two screws (25) securing the pump to the rear enclosure.
3. Separate tube (64) and tube (65) from the pump.
4. Separate tube (66) from the pump.
5. Separate the tubing from the pump to the T.E. unit.
6. Extract the pump wires from the 9-pin connector using Amp #305183 extraction tool. See Figures 6.1 and Figure 6.3.

To reinstall the pump, perform steps 1-6 in reverse order.

6.8 Reservoir Removal

1. Separate the front and rear enclosures. See front and rear enclosures, section 6.2.
2. Separate tube (64) and tube (65) from reservoir.
3. Remove the two screws securing the reservoir to the rear enclosure.
4. Extract the two brown float switch wires from the four-pin connector using Amp # 91065-1 extraction tool. See Figures 6.1 and 6.2.

Fig. 6.2 - 4-Pin Connector

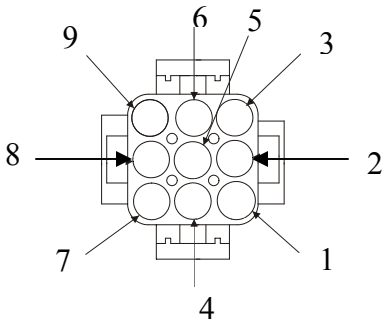


To reinstall the pump, perform steps 1 -4 in reverse order.

6.9 Thermoelectric Unit Removal

1. Separate the front and rear enclosures. See front and rear enclosures, section 6.2.
2. Remove the two screws securing the thermoelectric unit to the rear enclosure.
3. Extract the two black temperature sensor wires from the four-pin connector using Amp # 91065-1 extraction tool.
   See Figures 6.1 and 6.2.
4. Extract the red, black, and ground wires from the thermoelectric unit at the nine-pin connector.

Fig. 6.3 - 9-Pin Connector



1	BLACK FROM PUMP MOTOR
2	BLACK FROM PUMP MOTOR
3	GREEN/YELLOW FROM TE UNIT
4	GRAY FROM THERMOSTAT
5	GREEN/YELLOW FROM PUMP MOTOR
6	RED FROM TE UNIT
7	YELLOW FROM THERMOSTAT
8	BLANK
9	BLACK FROM TE UNIT

Also, extract the yellow and grey thermostat wires at the nine-pin connector. Use Amp #305183 extraction tool. See Fig. 6.1 and Fig. 6.3.

5. Separate the tube connecting the thermoelectric unit to the pump.
6. Separate the tube from the thermoelectric unit to the outlet coupling at the elbow (53).

To reinstall the thermoelectric unit, perform steps 1-6 in reverse order.

7. Troubleshooting Guide

7.1 General

This section provides information to aid the service technician in diagnosing problems with the *Electri-Cool* Localized Cold Therapy Unit. The left column lists potential problems; the right column lists the most probable causes.

Problem	***Probable Cause***
Unit will not turn on. (Power switch will not illuminate.)	1. Unit not plugged into proper voltage supply. 2. Tripped circuit breaker (100V, 110-120V). 3. Blown fuse (220-240V). 4. Tripped mains circuit breaker. 5. Defective power cord or plug.
Displays will not illuminate.	1. Cable between power supply circuit board and CPU board disconnected, improperly connected, or defective. 2. Defective power supply circuit board assembly. 3. Defective CPU board assembly.
Fan(s) will not run.	1. Loose or defective connection in fan leads. 2. Defective fan.
Unit will not cool. (No warning lights or blocked. error codes on)	1. Fan filter clogged. 2. Cooling slots on either or both ends of unit 3. Fan inoperative 4. Defective power supply circuit board assembly. 5. Defective CPU circuit board assembly. 6. Defective thermoelectric cooling unit.
Add Water warning alarm will not cancel with adequate water level in reservoir.	1. Loose, defective, or improper connection of float switch leads. 2. Defective float switch. 3. Defective CPU circuit board assembly. 4. Float stuck.
Water temperature display sensor. indicates “EEP”	1. Disconnected or defective water temperature 2. Water temperature below 32°F (0°C). 3. Defective CPU circuit board assembly.
Leakage current exceeds 300 microamperes;	1. Defective pump. 2. Defective fan.

(500 microamperes for 220-240V units)	3. Defective power supply circuit board assembly.

8. Service and Parts Information

8.1 Warranty and Repair Policy

The *Electri-Cool* unit is warranted against defects in material and workmanship under normal use and operation for a period of one year. Any parts found to be defective due to improper or lack of maintenance will be repaired or replaced at service and part rates in effect at that time. Note: After the warranty period has expired, CSZ will repair your unit for one flat rate. Please call the CSZ Technical Service department for further information. To qualify for credit, the warranty parts or unit must be tagged with the following information and returned to CSZ. Extended warranty available.

1. Serial number of the unit,
2. Return Materials Authorization (RMA) number (see below),
3. Cause or nature of failure, if known,
4. Date of installation or purchase, and
5. Invoice number under which the unit or part was purchased.

8.2 Obtaining Return Material Authorization Number

Before returning any parts or units to CSZ, first obtain an RMA number from our Medical Technical/Customer Service Department. Please carefully package all parts returned to the factory. Please indicate RMA number on shipping label. ***Please follow proper ESD procedure and use non-static shielded foam or bubble-pack to return the microprocessor control board***. Shipping damage will be the responsibility of the shipper. Insure as necessary.

8.3 Obtaining Replacement Parts

Replacement parts are available directly from CSZ. When ordering parts, specify the replacement part number and indicate the serial number of the unit. There is NO minimum order requirement for replacement parts. Parts are shipped F.O.B. (Cincinnati, Ohio, USA), generally within twenty-four hours.

To obtain parts or additional information regarding your unit, write or telephone:

Cincinnati Sub-Zero Products, Inc.
12011 Mosteller Road
Cincinnati, OH 45241-1528
Telephone: 1-513-772-8810
Toll Free: 1-800-989-7373
Fax: 1-513-772-9119

We strongly recommend that all repairs be done by properly trained staff.

8.4 Parts List

Item	Description
1	Drawer
2	Filter
3	Cap, Reservoir
4	Label, “Use Distilled Water”
5	Label, "Alarm Conditions"
6	Label, “Skin Probe”
7	Label, “400 Series”
8	Label, “Test Probe”
9	Label, “Outlet/Return”
10	Label, Instructions
11	Label, Logo, “Electri-Cool”
12	Label, Logo, “Cincinnati Sub-Zero”
13	Screw, 6-32 1/2" Lg. White Head
14	Screw, 8-32 1/2" Lg. SS
15	Assy., Rear Enclosure
16	Coupling, Hose, Panel, 3/8in.
17	Latch, Push-To-Release
18	Foot, Mounting
19	Gasket, Fill
20	
21	Label, “Hospital ID”
22	
23	
24	Screw, No. 6 3/8in. Lg., Hi-Lo Thd.
25	Screw, 6-32 3/8in. Lg., Pan Head
26	Screw, 6-32 1/2in. Lg., Pan Head
27	Lockwasher, #6, E t. Tooth
28	Hex Nut, 6-32
29	Assy., Fan
30	Power Supply, Vertical Board
31	Power Supply, Horizontal Board (100V and 230V units)
32	Screw, No. 6 1/4in. Lg., Hi-Lo Thd.
33	Screw, 6-32 5/8in. Lg., Pan Head
34	Screw, 6-32 3/4in. Lg., Pan Head
35	Assy., Front Enclosure
36	Panel, Control
37	
38	Control, CPU/Display Board
39	Terminal, Faston, .250

40	Assy., Ground Wire
41	Screw, 4-40 3/8in. Lg., Flat Head
42	Standoff, M/F, 3/8in. Lg.
43	Lockwasher, #4, E t. Tooth
44	Hex Nut, 4-40
45	Assy.,Thermoelectric Unit
46	Bracket, TE Mount, Right Side

Item	**Description**
47	Bracket, TE Mount, Left Side
48	Mount, Vibration Mount
49	Assy., Temperature Sensor
50	Thermostat, Backup
52	Tubing, 1/2in. Insulating Foam, 6-1/4in. Lg.
53	Elbow, 3/8in. 3/8in.
54	Tubing, 3/8in. ID 1-3/4in. Lg.
55	Tubing, 1/2in. Insulating Foam, 2-1/2in. Lg.
57	Assy., Pump
58	Bracket, Pump
59	Fitting, 1/4 FNPT 3/8 Hose
60	Block, Distribution
61	Elbow, 3/8 NPT 1/2 Hose
62	Elbow, 1/4 NPT 3/8 Hose
63	Elbow, 1/8 NPT 1/4 Hose
64	Tubing, 1/2in. ID 1-3/4in. Lg.
65	Tubing, 3/16in. ID 1in. Lg.
66	Tubing, 3/8in. ID 4-1/2in. Lg.
67	Reservoir
68	Assy., Float Switch
69	Label, “Full/Add”
70	Plate, Switch
	Plate, Switch, 230V
71	Switch, Power, DPST
	Switch, Power, DPST, 230V
72	Circuit Breaker, 7 AMP
73	Receptacle, Power Inlet
74	Receptacle, Fuse Drawer
75	Fuse, 5 x 20 mm, 3.15A
76	Power Cord

77		Bushing, Strain Relief
78		Cordstrap
79		Insulator, Power Supply (100V and 230V units)
	80	Shield, Condensation (100V and 230V units)

Fig. 8.1 Front to Rear Assembly

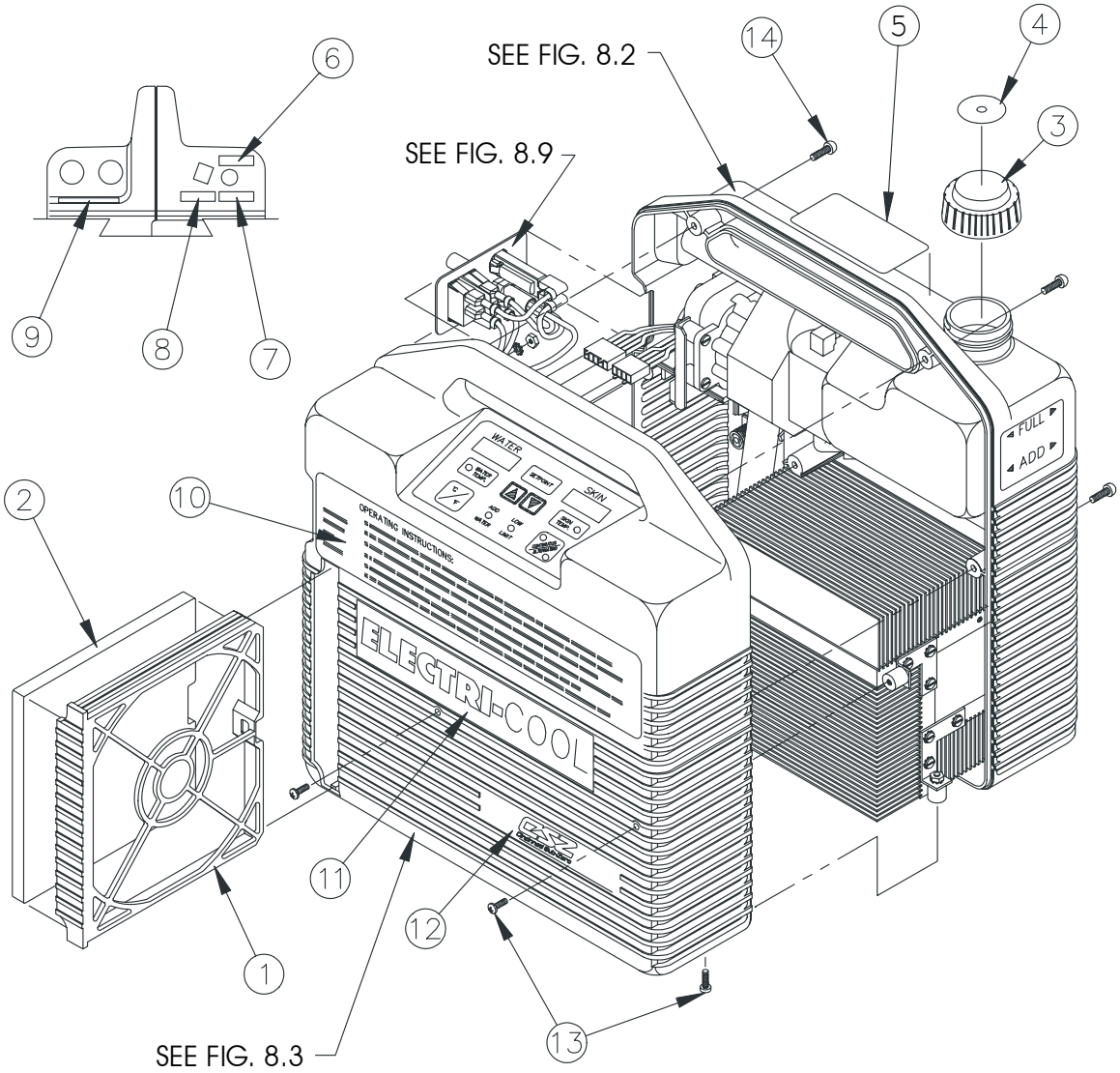


Fig. 8.2 Rear AssemblyFig.

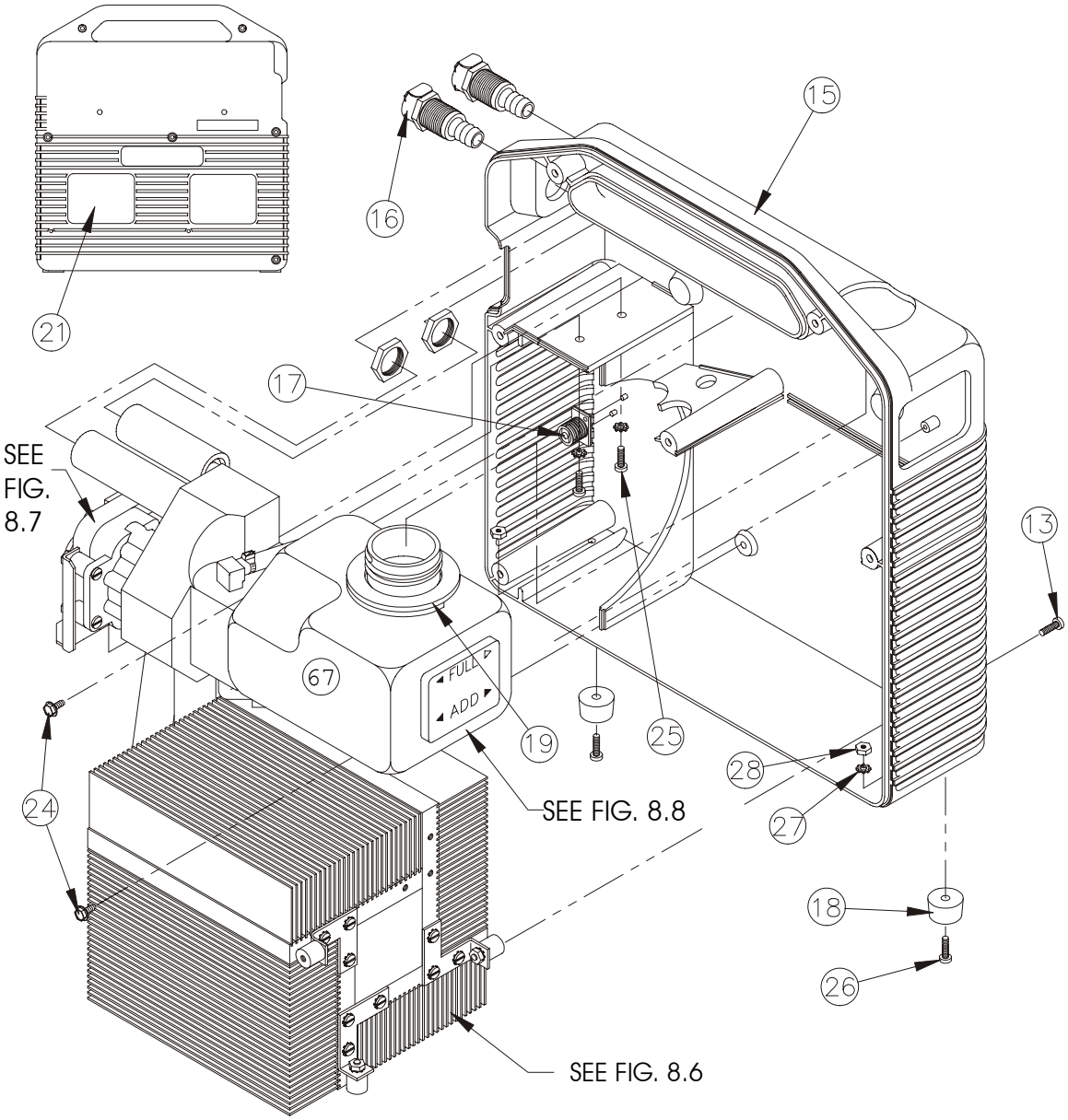


Fig. 8.3 Front Assembly w/ Power Supply (110V)

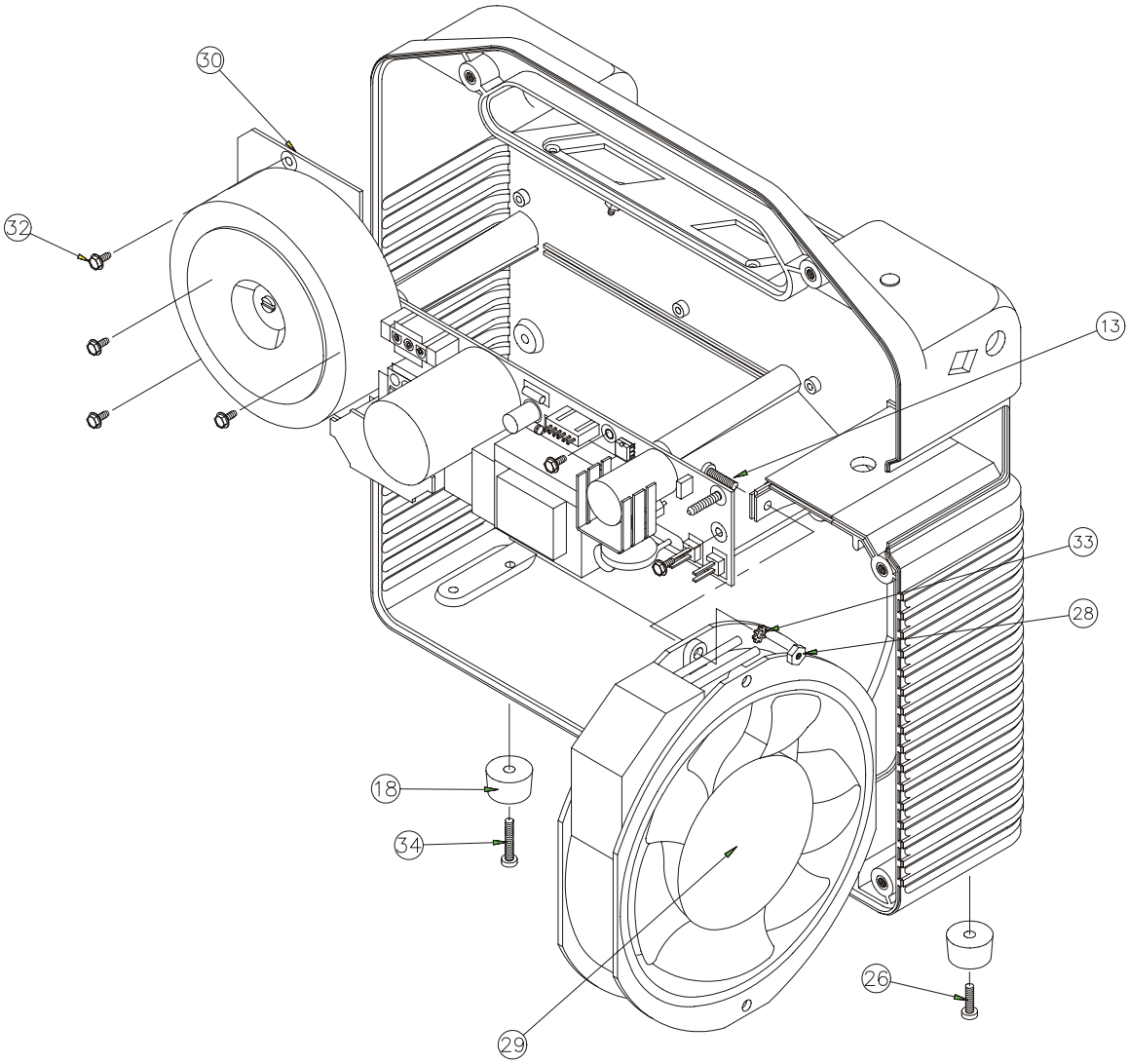


Fig. 8.4 Front Assembly w/ Power Supply (100V & 230V)

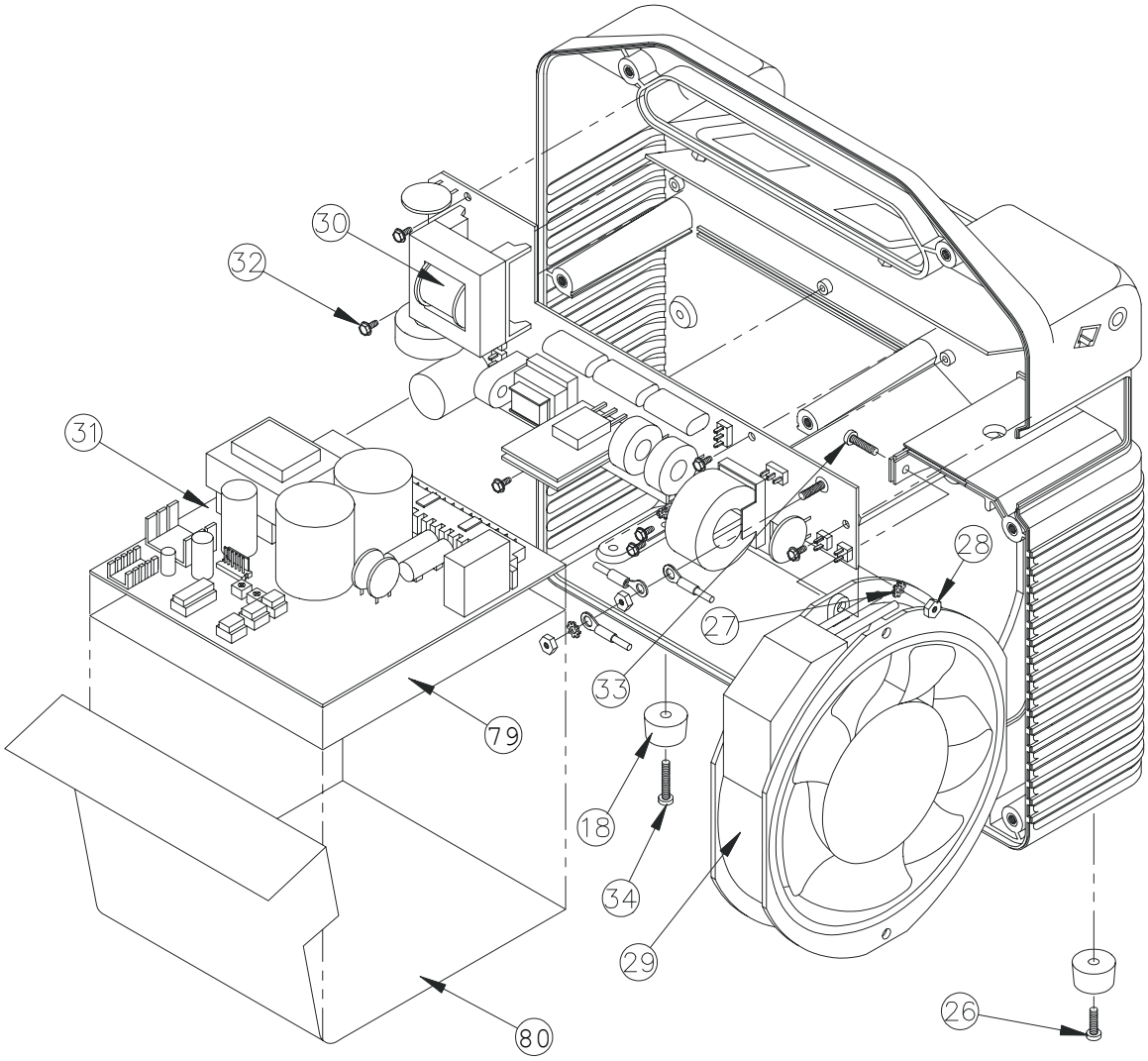


Fig. 8.5 Front Assembly w/ CPU Board

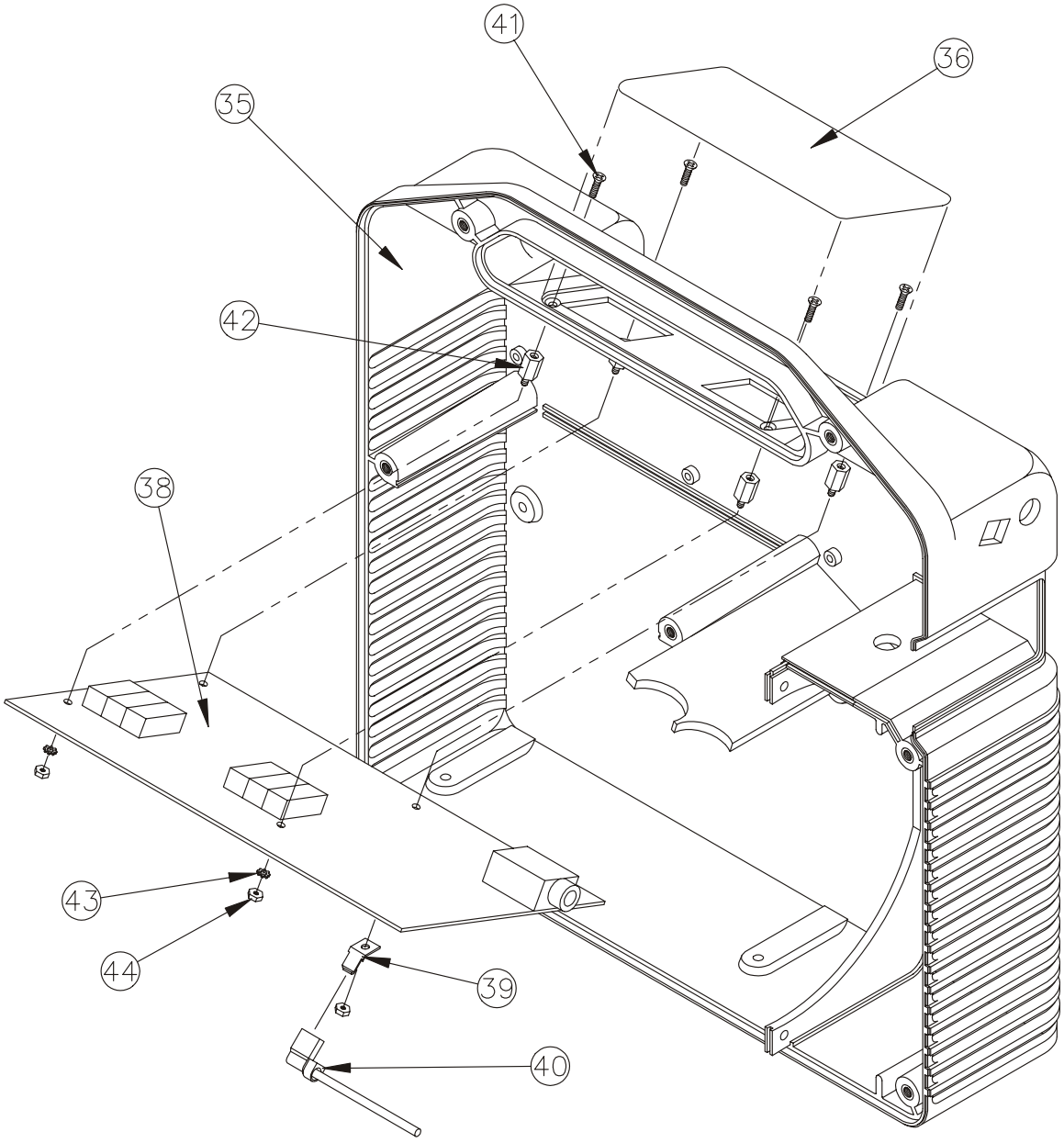


Fig. 8.6 Thermoelectric Unit Assembly

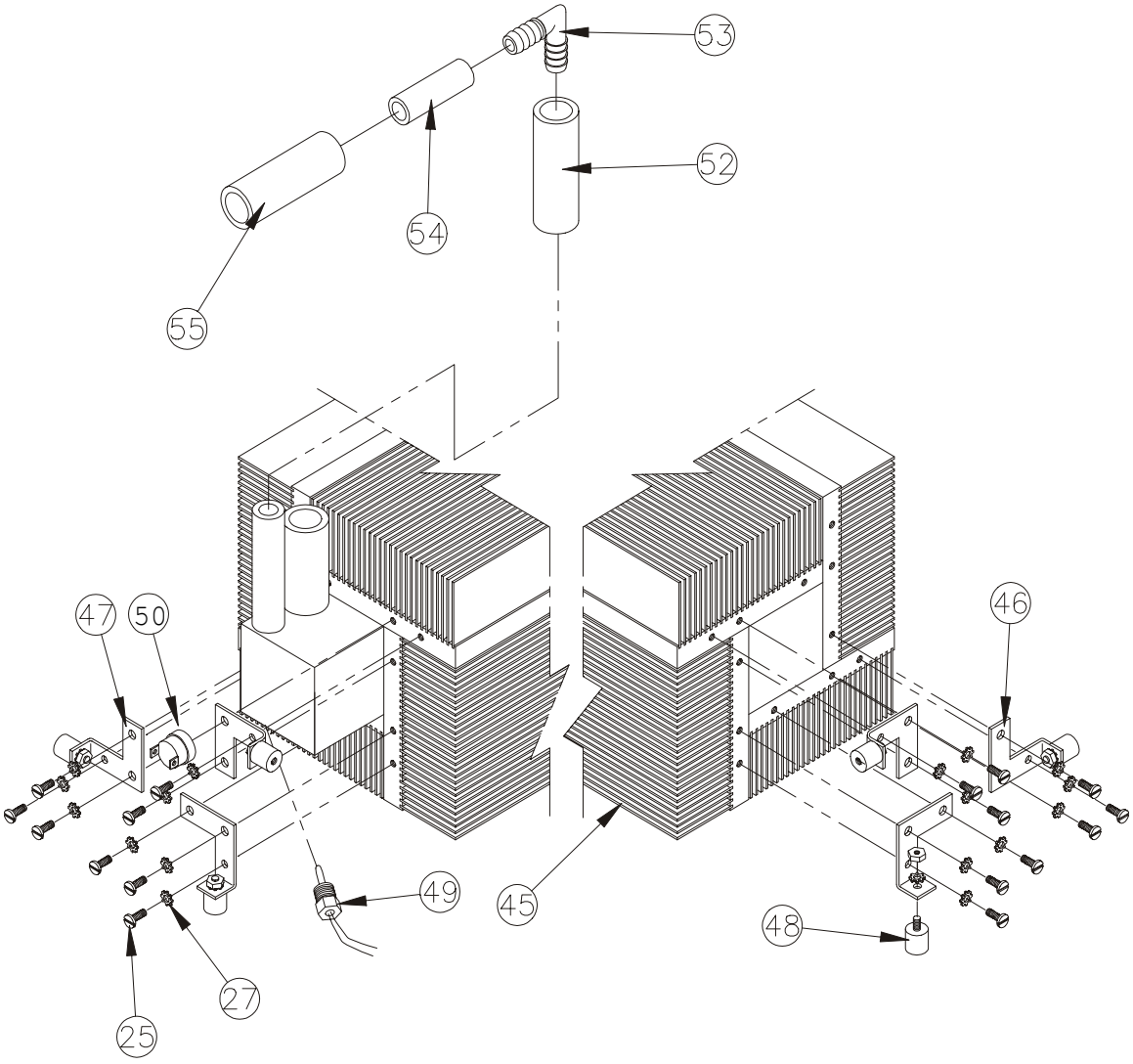


Fig. 8.7 Pump Assembly

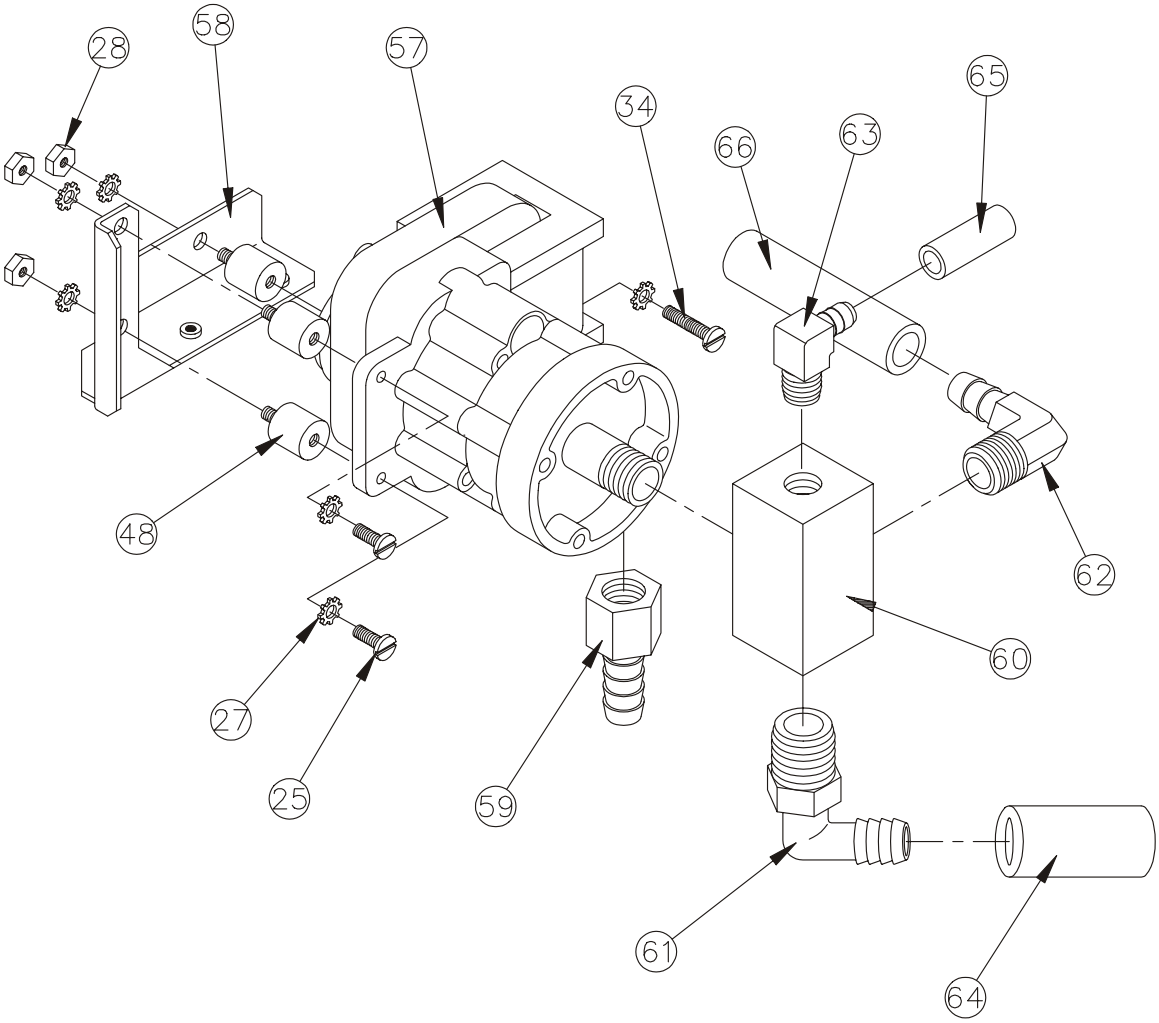


Fig. 8.8 Reservoir Assembly

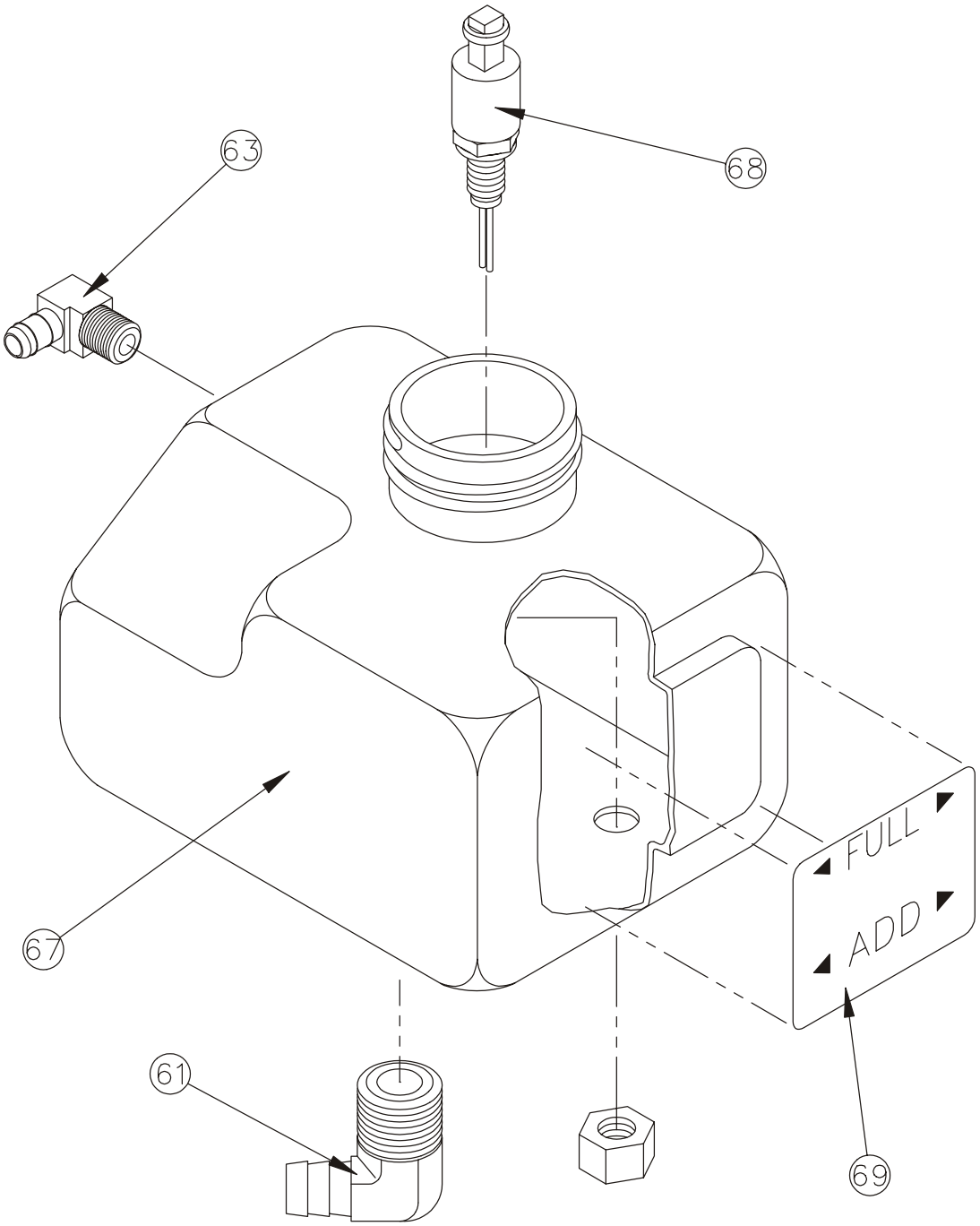


Fig. 8.9 Switch Plate Assembly

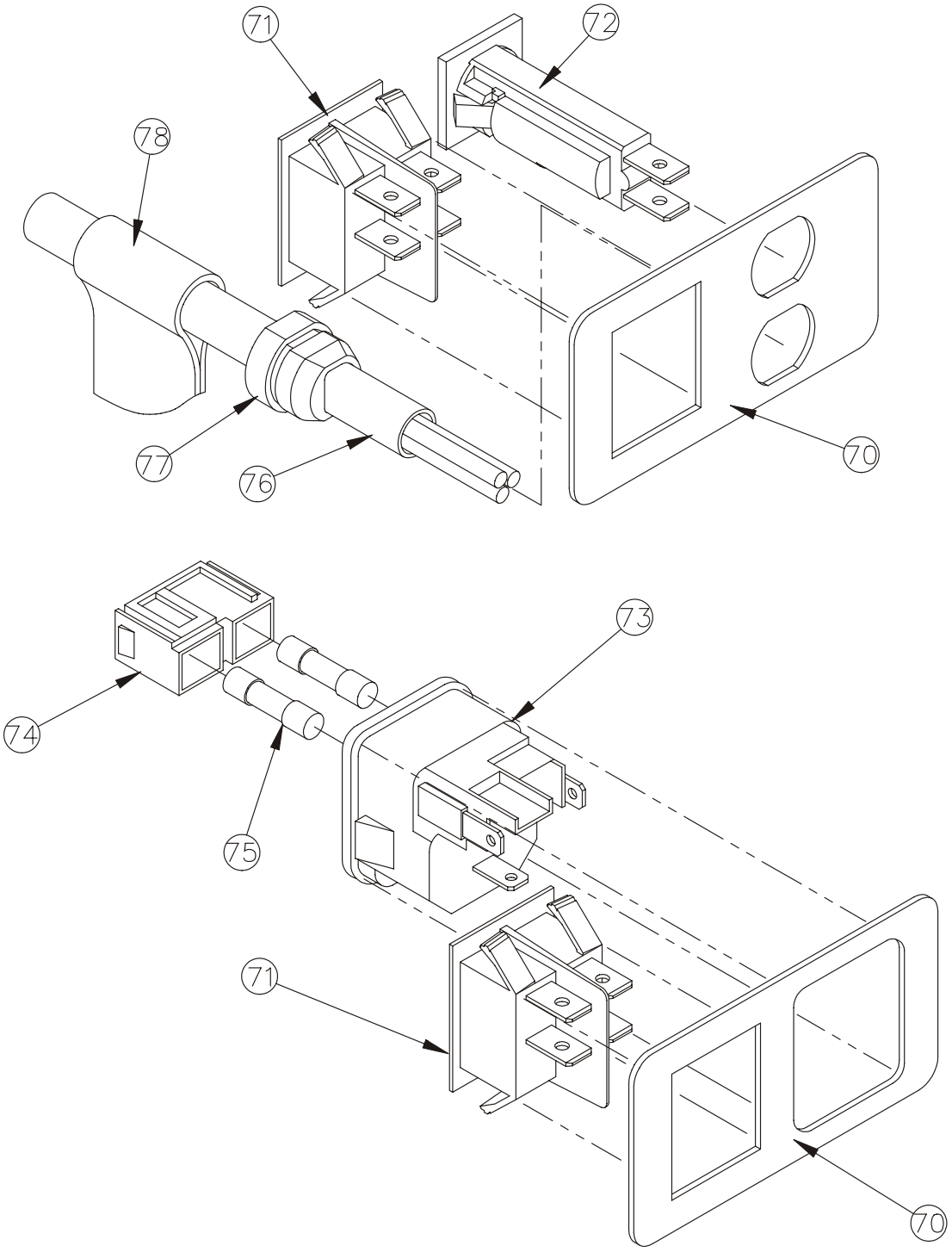
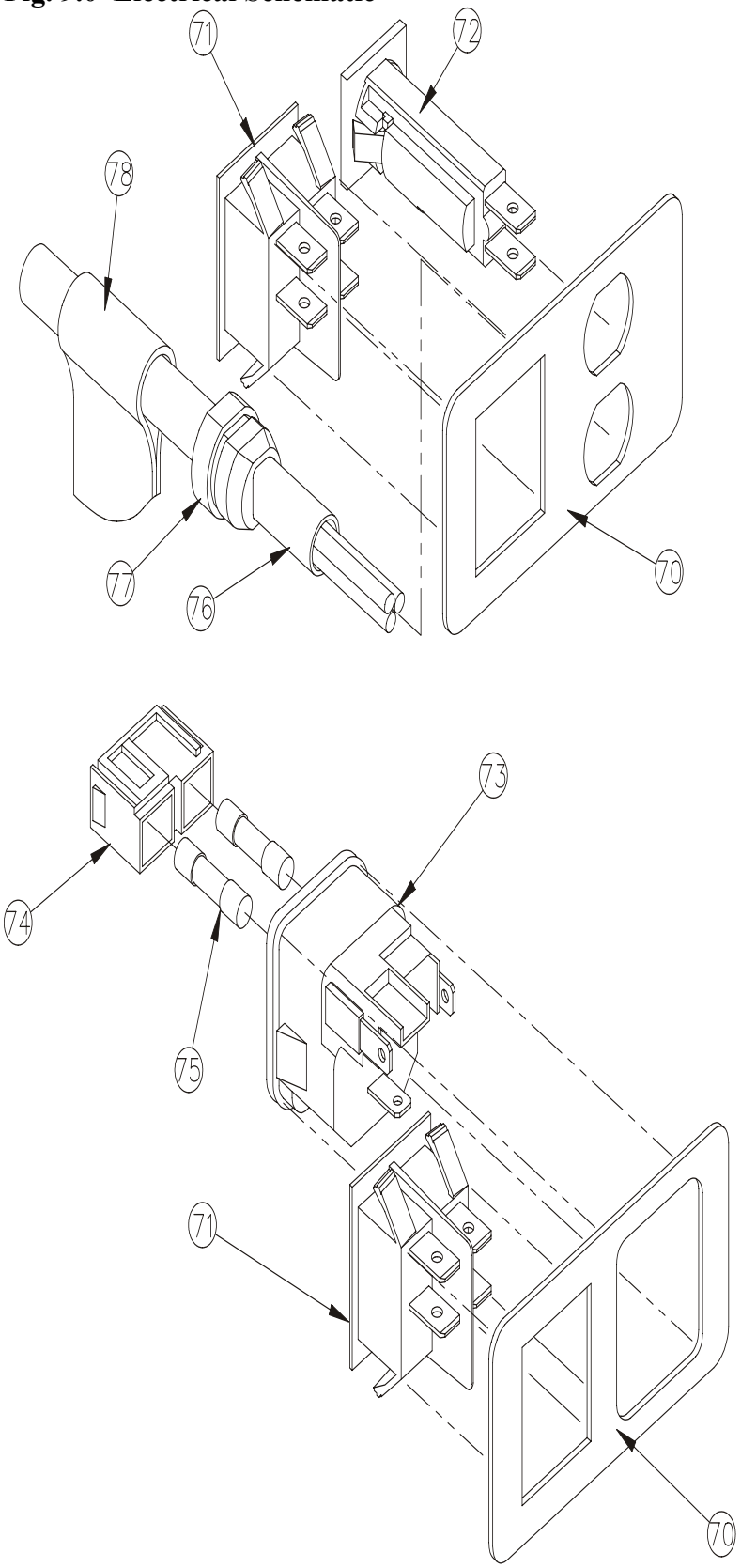


Fig. 9.0 Electrical Schematic



9. Recommended Spare Parts

I.D. No.	Description
70012	Cap, Vented Screw
70114	Switch, DPST Rocker
70295	Sensor, Thermistor Temperature
70307	Coupling, Panel Hose, 3/8
70421	Foot, 3/4 Mounting
70441	Tubing, 3/8 ID x 9/16 OD
79299	Assembly, Pump
70682	Mount, Vibration Bumper
70683	Reservoir
70686	Enclosure, Front
70687	Enclosure, Rear
70688	Drawer
70693	Panel, Control
70736	CPU Board
79295	Assembly, Float Switch
70858	Thermostat, 145°F. ±5°F
70884	Plug, Dome
71065	Manual, Product
71356	Gasket, Fill Opening
71903	Circuit Board, 115V
71956	Connector Plug, 9-pin
79768	T.E. Unit
70721	Filter, Disposable Air
79134	Assembly, Temperature Sensor
70735	Power Cord

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